

REMARKS

Applicants have amended claims 10 and 11. Applicants acknowledge the Examiner's allowance of claims 1, 4-9, and 28-38.

Claims 1, 4-11, 14-16, 22, 24-26, and 28-49, of which claims 1, 10, 22, 28, and 39 are independent in form, are presented for examination.

Claim Rejections — 35 U.S.C. § 112

The Examiner has rejected claims 10, 11, 14-16, 22, and 24-26 under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement.

As amended, claim 10 recites a cathode comprising expanded graphite particles having a BET surface area of at least about 5 m²/g, and less than about 14 m²/g. Support for the BET surface area range in claim 10 is provided, for example, in Table 1 of Applicants' application, which lists expanded graphite particles with BET surface areas of 5.0 m²/g, 12.3 m²/g, and 13.9 m²/g. (Application, page 4.) Applicants therefore request that the rejection of claims 10 and 14-16 be withdrawn.

As amended, claim 11 recites a cathode comprising expanded graphite particles having a BET surface area of greater than about 10 m²/g and less than about 14 m²/g. Support for the BET surface area range in claim 11 can be found, for example, on page 2 of Applicants' application, which provides that the expanded graphite particles can have a BET surface area of greater than about 10 m²/g, and in Table 1 on page 4 of Applicants' application, which lists expanded graphite particles with BET surface areas of 12.3 m²/g and 13.9 m²/g. Thus, Applicants request that the rejection of claim 11 be withdrawn.

Claims 22 and 24 recite a cathode comprising expanded graphite particles having a D₅₀ particle size that is greater than 40 microns and less than or equal to about 100 microns (claim 22) or about 50 microns (claim 24). The Examiner has stated that the language "greater than 40 microns" is considered to be new matter. (April 13, 2004 Reply to Office Action, page 3.) But support for "greater than 40 microns" is provided, for example, in Table 1 of Applicants' application, which lists the D₅₀ particle size of the sample F (BNB90) expanded graphite

particles as 40.1 microns. (Application, page 4.) Table 1 provides additional support for a D₅₀ particle size range of greater than 40 microns and less than or equal to about 100 microns by listing, for example, expanded graphite particles with D₅₀ particle sizes of 50.2 microns and 97.2 microns. Thus, Applicants request that the rejection of claims 22 and 24-26 be withdrawn.

Claim Rejections – 35 U.S.C. § 103(a), Barsukov & Tsuneaki

The Examiner has rejected claims 10, 11, 14-16, 22, and 24-26 under 35 U.S.C. § 103(a) as obvious over U.S. Published Patent Application No. US 2001/0041293 A1 (“Barsukov”) in view of Japanese Published Patent Application No. 10-284065 (“Tsuneaki”). Claims 10, 11, 14-16, 22, and 24-26 recite a cathode comprising expanded graphite particles having a BET surface area of at least about 5 m²/g and less than about 14 m²/g, or a D₅₀ particle size of greater than 40 microns and less than or equal to about 100 microns.

While the Examiner has admitted that Barsukov does not expressly teach expanded graphite with the claimed BET surface area or D₅₀ particle size, the Examiner nonetheless has asserted that it would have been obvious to combine Tsuneaki with Barsukov to make the cathodes recited in claims 10, 11, 14-16, 22, and 24-26, because Tsuneaki describes expanded graphite with a BET surface area of from 5 m²/g to 50 m²/g and an average particle diameter of 1-50 microns. This assertion, however, contradicts the Examiner's position taken in an earlier Office Action.

Previously, the Examiner had asserted that one skilled in the art reading Barsukov would have been motivated to use expanded graphite described in another reference, Nardi. More specifically, Barsukov describes an “engineered carbonaceous material (ECM)” that includes “a mixture of expanded graphite and one or more other graphite materials” (Barsukov, Abstract.) In the Background section of his application, Barsukov provides a number of references, including PCT Application No. WO 99/34673 (Nardi), that describe expanded graphite particles. (See Barsukov, page 1, ¶0004.) In an earlier Office Action (dated October 29, 2003), the Examiner explained that Barsukov's Background section would motivate one of skill in the art to use Nardi's expanded graphite particles in combination with Barsukov:

“[T]he artisan would be motivated to use the expanded graphite of Nardi [WO 99/34673] as the expanded graphite of Barsukov et al. [because] [i]n the abstract of Nardi, it is disclosed that [the Nardi] graphite provides ‘enhanced service performance’ to the cell. Furthermore, Barsukov et al. identify the disclosure of Nardi in paragraph 4, and state that such expanded graphite materials ‘result[] in impressive improvements in the service performance of electric chemical cells’ in paragraph 5. Accordingly, the artisan would be motivated to use the expanded graphite of Nardi as the expanded graphite of Barsukov et al.” (October 29, 2003 Office Action, pages 7-8, emphasis added.)

Now, however, the Examiner asserts that one of ordinary skill in the art would be motivated to use Tsuneaki's expanded graphite particles in Barsukov's ECM mixture. This current assertion clearly contradicts the Examiner's earlier assertion that one of ordinary skill in the art would be motivated to use Nardi's expanded graphite particles in Barsukov's ECM mixture. Indeed, in light of the Examiner's previous assertion, a person of ordinary skill in the art would actually not be motivated to combine Tsuneaki with Barsukov because Barsukov already discloses certain expanded graphite particles, namely those of Nardi. Maintaining the Examiner's current § 103 rejection based on the combination of Barsukov and Tsuneaki would indicate that Applicants' claims were rejected by using Applicants' specification as a template and cobbling together the references.

In light of the above remarks, Applicants request that the § 103 rejections based on the combination of Barsukov and Tsuneaki be reconsidered and withdrawn.

Claim Rejections – 35 U.S.C. § 103(a), Barsukov & Ishii

The Examiner has rejected claims 39-49 as obvious over Barsukov in view of U.S. Published Patent Application No. US 2001/0033822 A1 (“Ishii”). As amended, claims 39-49 recite a cathode comprising expanded graphite particles having a total pore volume greater than about 0.1 milliliter per gram.

The Examiner has admitted that, “Barsukov . . . [does] not expressly teach . . . expanded graphite [with] a total pore volume of greater than about 0.1 mL/g” (April 13, 2004 Office Action, page 5.) However, the Examiner has stated that Ishii teaches graphite particles with a

pore volume of 0.4-2.0 cc/g, and has argued that one of ordinary skill in the art “would be motivated to use the graphite of Ishii . . . in the battery of Barsukov . . .” (Id. at page 6.)

But one of ordinary skill in the art would not be motivated to combine Ishii with Barsukov. As discussed above, the Examiner has asserted in the past that a person of ordinary skill in the art would be motivated to use the expanded particles that are described in Nardi in the ECM described in Barsukov. While Barsukov provides several references that describe expanded graphite particles, Barsukov does not include Ishii among those references.

Furthermore, even if one of ordinary skill in the art would be motivated to combine Ishii with Barsukov, which Applicants do not concede, the combination would not result in the cathode recited in claims 39-49. As discussed above, claims 39-49 recite a cathode comprising expanded graphite particles. Ishii does not describe expanded graphite particles. While the Examiner has claimed that, “the artisan would be motivated to use the graphite of Ishii et al. as the expanded graphite of Barsukov et al.”, the Examiner has not provided support for the assertion that the graphite in Ishii is expanded graphite. (April 13, 2004 Office Action, page 6.) If one of ordinary skill in the art were to use the graphite particles of Ishii in the battery of Barsukov, there is no indication that the resulting battery would include expanded graphite, and thus would not have all of the elements of the battery recited in claims 39-49.

For at least the reasons provided above, Applicants request that the Examiner's rejection of claims 39-49 be withdrawn.

Applicants believe that the claims are in condition for allowance, which action is requested.

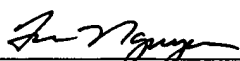
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Page : 13 of 13

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Respectfully submitted,

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